Study finds link between preeclampsia and reduced thyroid function

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Women who experience preeclampsia, a serious complication of pregnancy, may have an increased risk for reduced thyroid functioning later in life, report a team of researchers from the National Institutes of Health and other institutions.

The analysis combined two separate studies which each suggested a link between preeclampsia and reduced thyroid function. In the first study, women who developed preeclampsia were more likely to have slightly reduced thyroid functioning during the last weeks of their pregnancies.

The second study found that women who had preeclampsia during their pregnancies were more likely to have reduced thyroid functioning more than 20 years after they had given birth, when compared to women who had not had preeclampsia during pregnancy.

The study authors advised physicians treating women with a history of preeclampsia to be aware that this group of patients may be at increased risk for reduced thyroid functioning.

Funding for the research was provided in part by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD and the National Heart Lung and Blood Institute, both of the NIH.

"The findings suggest that the possible development of hypothyroidism is a consideration in patients with a history of preeclampsia," said Susan

B. Shurin, M.D., acting director of the NICHD. "Reduced thyroid functioning is easy to diagnose when suspected, and inexpensive to treat. Replacement therapy substantially improves quality of life of affected persons."

The study appears in the November *BMJ*, the publication formerly known as the British Medical Journal. Its lead author is Richard J. Levine, M.D., M.P.H., a senior investigator in NICHD's Division of Epidemiology, Statistics, and Prevention Research.

The thyroid gland, located in the front of the throat, makes hormones that help regulate heart rate, blood pressure, body temperature, and the conversion of food into energy. Reduced thyroid functioning, or hypothyroidism, results in overall weakness and fatigue and also increases the risk for cardiovascular disease.

Preeclampsia is a life-threatening complication that occurs in 3 to 5 percent of pregnancies. The condition results in high blood pressure and protein in the urine. Preeclampsia may begin with mild symptoms, then progress to severe preeclampsia and to eclampsia—dangerously high blood pressure and convulsions—which may result in disability or death. The only cure for preeclampsia is delivery of the baby.

The causes of preeclampsia are not known. In earlier work, Dr. Levine and his coworkers reported that high levels of two molecules in the blood may cause symptoms of preeclampsia.

One of those molecules, soluble fms-like tyrosine kinase 1 (sFlt-1), acts by blocking a protein called vascular endothelial growth factor (VEGF). Previous studies have found that some cancer patients receiving treatments that block VEGF have developed hypothyroidism, a condition in which the thyroid hormone fails to produce enough hormones. For this reason, Dr. Levine investigated whether women with preeclampsia

might also experience similar problems with thyroid functioning.

For the current study, researchers tested blood samples collected from an earlier NIH-led study on preeclampsia, for levels of thyroid stimulating hormone (TSH), which stimulates the thyroid gland. Elevated levels of TSH are an indication that the thyroid is not functioning properly.

The researchers found a link between preeclampsia and reduced thyroid functioning.

Early in their pregnancies, women who went on to develop preeclampsia had thyroid functioning identical to that of the women who never developed preeclampsia. But toward the end of their pregnancies, the women with preeclampsia had, on average, much higher levels of TSH than women with no history of preeclampsia. Moreover, the increase in TSH was strongly associated with an increase in blood levels of sFLT-1.

Only two of the women had both high levels of TSH and low levels of thyroid hormone, which meant doctors would consider them to have hypothyroidism, or underactive thyroid. In both women, hypothyroidism developed during pregnancy, but after the onset of preeclampsia. Although they did not have any other symptoms of reduced thyroid function, 1 out of every 4 of the other women with preeclampsia had levels of TSH above the range considered normal. Of the women without preeclampsia, that proportion was only 1 in 7.

The first study did not provide information on whether reduced thyroid functioning extended beyond the end of the pregnancy, when preeclampsia's symptoms cease. The researchers next turned to data collected in the mid-1990s in a county wide study in Norway. The researchers analyzed data from 7,121 women who had given birth to a first child in 1967 or later, and had had their blood samples tested for thyroid function in the county wide study in the mid-1990s.

The researchers discovered that the women who had preeclampsia in their first pregnancy were 1.7 times as likely to have high TSH as the women who had not had preeclampsia. Women who had preeclampsia in both their first and second pregnancies were nearly 6 times as likely to have high TSH levels.

The TSH testing took place in the 1990s, an average of more than 20 years after the women's first pregnancies.

"Many of these women still had reduced thyroid function," Dr. Levine said. "This suggests that a history of preeclampsia may predispose women to the later development of reduced thyroid function."

Source: NIH/National Institute of Child Health and Human Development (news : web)

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